PATENT CLAIMS

1. A heat insulating layer with a melt above 2500°C with a thermal expansion coefficient in excess of $8 \times 10^{-6} K^{-1}$ and a sintering temperature greater than 1400°C

characterized in that

the heat insulating material has a perovskite structure of the general formula $A_{1+r} (B'_{1/3+x} B''_{2/3+y})O_{3+z}$ in which

A = at least one element of the group (Ba, Sr, Ca, Be),

B' = at least one element of the group (Mg, Ca, Sr, Ba, Be),

B" =at least one element of the group (Ta, Nb), and

$0.1 < r, x, y, z < 0.1$;

or the heat insulating material has the perovskite structure of the general formula $A_{1+r} (B'_{1/2+x} B''_{1/2+y})O_{3+z}$ in which:

A = at least one element of the group (Ba, Sr, Ca, Be),

B' = at least one element of the group (Al, La, Nd, Gd, Er, Lu, Dy, Tb)

B" =at least one element of the group (Ta, Nb), and

$0.1 < r, x, y, z < 0.1$.

2. A heat insulating material according to claim 1 in which the heat insulating material has a composition wherein $r = x = y = z = 0$.

3. The heat insulating material according to one of the preceding claims 1 to 2 with a composition of the formula $Ba(Mg_{1/3}Ta_{2/3})O_3$.

4. The use of the heat insulating material according to one of claims 1 through 3 as a heat insulating coating on the surface of the component.

5. The use according to the preceding claim 4 in which between the component and the heat insulating component one or more intermediate coatings of ceramic glass or metallic material is provided.

6. The use according to the preceding claim 5 wherein between the component and the heat insulating layer, a MCrAlY alloy is provided where M = Co, as Ni material for the intermediate layer.

7. The use according to the preceding claim 5 in which between the component and the heat insulating layer a (platin-) aluminide layer is provided for an intermediate layer.

8. A method of making a heat insulating material according to one of claims 1 to 3 characterized in that the starting material is provided as carbonates and/or oxides corresponding to the aforedescribed stoichiometry in a mixture and this mixture is subjected to a solid state reaction whereby the heat insulting material thus produced has the corresponding stoichiometry and the perovskite structure.

9. The method according to claim 8 wherein the mixture is so formed that the perovskite produced by the solid state reaction has a composition according to the formula $A_{1+r}$ $(B'_{1/3+x}$ $B''_{2/3+y})O_{3+z}$ or according to the formula $A_{1+r}$ $(B'_{1/2+x}$ $B''_{1/2+y})O_{3+z}$ with $0.1 < r, x, y, z < 0.1$.

10. The method according to claim 8 or claim 9 characterized in that the mixture is so made that the perovskite after the solid state reaction has a composition according to the formula $A_1$ $(B'_{1/3}$ $B''_{2/3})O_3$ or according to the formula $A_1$ $(B'_{1/2}$ $B''_{1/2})O_3$.